2019 ANNUAL WEATHER SUMMARY
FOR THE CENTRAL CALIFORNIA INTERIOR

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Monthly Recap of Temperature and Precipitation Patterns

January

Well above average temperatures with near to above average precipitation. Storm systems passed over the region during the early (after the 4th) and middle parts of the month. The latter part of the month was generally quiet, except for a storm that arrived on the 31st. However, during the quite periods, dense fog formed in parts of the Central Valley, including around Hanford, Madera, and Merced.

On the 5th, a storm system brought precipitation to much of the region, including snow above 5,000 feet. Afterward, strong winds were reported throughout the region on the 6th. Wind gusts of 30 to 45 miles per hour occurred in much of the San Joaquin Valley. The strongest winds were in Kern County, where gusts as strong as 75 to 90 miles per hour occurred over the ridge tops and below the passes in the mountain and desert areas of eastern Kern County. Otherwise, gusts reached around 45 to 60 miles per hour in much of these mountain and desert areas.

Additional stormy weather periods were observed during the middle part of the month. Snow fell down to around 4,000 feet at the Grapevine in Kern County on the 14th until the morning of the 15th; this was enough for a shutdown of Interstate 5. Additionally, gusty winds of around 55 to 65 miles per hour blew over some semi-trucks along Highway 58 just to the east of Bakersfield. Another cold, unstable system arrived shortly afterward on the 17th; and an EF-1 tornado was reported on the northeast side of Clovis. Finally, another storm system started to impact the region on the 31st. Snow levels were generally around 4,000 to 7,000 feet throughout the month.

The month was much warmer than average – Bakersfield had its 6th warmest January on record, while Fresno had its 3rd.

February

Below average temperatures with near to above average precipitation. The early and middle parts of the month remained active in terms of storm passages. In addition, cold air brought low snow levels at times, along with freezing morning temperatures in the San Joaquin Valley. Dense fog was not reported in the Central Valley, except for a couple of mornings around Hanford and Madera.

On the 2nd, an EF-0 tornado occurred about 8 miles south of Mariposa. Three separate weather systems brought snow levels down to around 2,500 feet, especially in the early and middle parts of the month. On the 4th and 5th, hail and snow fell at around 2,500 feet in the Sierra Nevada

foothills, mainly from Fresno County northward. On the 10th, several inches of snow caused Interstate 5 to shut down through the Grapevine in Kern County for that evening and much of the overnight hours into the 11th. On the 15th, another storm brought showers and thunderstorms to the region, including an EF-0 tornado that touched down in the Sierra Nevada foothills near Coarsegold. On the 21st, an even colder system brought snow down to 1,500 feet to the Grapevine, including at the California Highway Patrol weigh station. There were several days with low temperatures at or below freezing in the San Joaquin Valley. The overall active period with relatively cold storms allowed temperatures to reach below average throughout the month.

March

Near average temperatures with near to above average precipitation. The first week of the month was especially stormy with heavy rain and relatively mild temperatures. Otherwise, the month was characterized with mild temperatures with additional periods of precipitation.

A majority of the precipitation occurred during the first week of the month. With the first storm of the month, on the 2nd, scattered showers and isolated thunderstorms occurred over much of the region. Additionally, an EF-0 tornado occurred about 5 miles west of Mendota (west side of the San Joaquin Valley in Fresno County). This tornado caused minor roof damage and had estimated gusts to 70 miles per hour. Another EF-0 tornado occurred within the town of Mendota on the 4th. The next storm on the 5th and 6th brought heavy rain to much of Kern County along with snow above 8,000 feet to the mountain areas, including the southern Sierra Nevada. A neighborhood near Lake Isabella (or just to the southeast of Weldon along Kelso Creek) was evacuated on the 6th due to high flows in Kelso Creek and the Kern River (South Fork) caused by heavy rainfall combined with abundant snow melt in the nearby mountains. There were additional storms throughout the month, but with less precipitation. Otherwise, periods of gusty winds occurred in the Kern County mountain and desert areas, as well as in the hills along the west side of the San Joaquin Valley. The strongest wind gusts occurred in the mountain and desert regions of Kern County on the 12th. Wind gusts of up to 70 to 80 miles per hour were recorded, and there were reports of semi-trucks blown over. On the 20th, there were some isolated thunderstorms that brought heavy rainfall to locations near Visalia (Woodlake and Lemon Cove) as well as in the Sierra Nevada east of Porterville (near Springville and Camp Nelson). Temperatures ended up near average for the month, as the storm track consistently affected much of the state. Due to the active first week, Bakersfield ended up with above average precipitation, while other locations mainly reported near average amounts for the month.

April

Well above average temperatures with below average precipitation. There were a couple of brief storm systems towards the beginning and middle parts of the month. Much warmer than average temperatures prevailed towards the end of the month.

A couple of systems brought some precipitation in the early and middle parts of the month. Mainly light showers moved over the region on the 5th, and the first week of the month was cooler than average. On the 9th and 10th, a storm system brought gusty winds to the usual prone areas in eastern Kern County where wind gusts reached up to 45 to 60 miles per hour. A brief

warm period soon followed; temperatures reached as much as 10 degrees above average on the 13th and 14th. By the middle of the month, cooler and stormy weather returned, and a few showers moved over the region on the 15th and 16th. Scattered thunderstorms produced gusty outflow winds in the Kern County desert that afternoon; there was even an EF-0 tornado in Ridgecrest that caused no damage. During the last two weeks of the month, high temperatures reached into 90s at the warmest locations of the San Joaquin Valley and the Kern County desert. Towards the end of the month, highs were just shy of 100 degrees in the warmest spots, or on the 25th through the 28th. Cooler weather with gusty winds returned just in time to end the month. Due to the hot temperatures in the latter part, this month ended up warmer than average.

May

Cooler than average temperatures with well above average precipitation. There were several periods of active, or cool and wet, weather in the latter half of the month, including showers and thunderstorms that produced hail, isolated funnel clouds, and weak tornadoes in the San Joaquin Valley.

A series of storms brought showers and thunderstorms during the middle and late parts of the month. On the 19th, there was an EF-0 tornado near Huron (west of Lemoore) with estimated gusts of 70 miles per hour. This tornado uprooted a pistachio tree and moved it about 100 yards away but otherwise caused no structural damage. Plenty of late season snow fell in the Sierra Nevada, although it was mainly above 6,000 feet. However, a very cold storm system impacted the region during Memorial Day weekend (on the 26th) and brought snow above 4,000 feet along with scattered thunderstorms producing hail and isolated funnel clouds. On the last day of the month, yet another storm brought heavy rain to the Sierra Nevada foothills in Mariposa County. This storm system produced minor flooding and debris flow near the Ferguson Burn Scar.

June

Well above average temperatures with near to above average precipitation. A majority of the precipitation occurred at the beginning of the month, especially in the western and southern parts of the San Joaquin Valley and much of the Sierra Nevada.

The first two days of the month experienced an active weather. Scattered showers and thunderstorms produced brief heavy rain and small hail (0.25 to 0.50 inch in diameter) over Kern County, the Sierra Nevada, and in the hills along the west side of the San Joaquin Valley. On the 2nd, both Kettleman City and Coalinga reported almost one inch of rain in about an hour. Bakersfield even had strong and gusty winds due to thunderstorms, and reported 0.23 inch of rain. During that afternoon, an EF-0 tornado with estimated gusts of 65 miles per hour touched down between Bakersfield and Arvin (or several miles from each city). In addition, there were some brief periods with cooler, breezy conditions due to low pressure systems passing over Northern California during the early and later parts of the month. Otherwise, the region had the typical summer, or hot and dry, weather.

July

Near to above average temperatures with little precipitation. There was one extended period (about 10 days) of triple digit high temperatures in the San Joaquin valley towards the end of the month. Some subtropical moisture arrived by the 23rd that produced showers and thunderstorms mainly over the mountains and desert. A brief period of very hot temperatures with dry weather followed towards the end of the month.

Hot, dry weather prevailed for much of the month. However, there were some brief periods with cooler, breezy conditions due to low pressure systems passing over Northern California. The month ended up slightly warmer than average temperatures. Tropical moisture that moved from the southeast, or the Desert Southwest, brought afternoon showers and thunderstorms over the Sierra Nevada during the 22nd through the 26th. The warmest period was towards the end of the month, or on the 28th. Highs reached around 105 to 110 degrees that day, including in the San Joaquin Valley and Kern County desert.

August

Warmer than average with little or no rain. However, no extended periods (longer than 6 consecutive days) of triple digit high temperatures in the San Joaquin Valley were recorded.

Typical summer weather continued for much of the month. The only exception to this occurred on the 26th and 27th when there was afternoon thunderstorms in the Sierra. Little or no rainfall accumulated with these storms. The warmest period was mainly during the middle part of the month. Temperatures were moderately above average, or about 2 to 3 degrees warmer than the month's mean.

September

Near average temperatures with below average precipitation. There a brief period of showers and thunderstorms during the first week of the month which occurred primarily in Kern County, the far southern end of the Sierra Nevada, and the south end of the San Joaquin Valley. Well below average temperatures occurred on the last two days of the month as low pressure systems passed over Northern California.

The month began hot and dry with some exceptions. Most notably was on the 5th, when tropical moisture brought showers and thunderstorms to Kern County, including in the mountains, desert, and south end of the San Joaquin Valley. Measurable rain fell in the south end of the San Joaquin Valley, including 0.02 inch at Bakersfield. Isolated thunderstorms also developed over the Sierra Nevada crest. Relatively cool temperatures prevailed during much of the middle part and the last few days of the month as low pressure systems over Northern California brought breezy conditions, especially towards the west side of the San Joaquin Valley. Temperatures were much cooler than average for the last two days by as much as 15 degrees. Daily highs were only in the 70s in the Central Valley with nighttime lows in the upper 40s.

October

Cooler than average with below average precipitation. Almost no precipitation was reported, except for a system that passed over Yosemite and locations just to the south on the 27th that brought light precipitation. The month had several episodes with gusty winds, low humidity, and reduced air quality due to blowing dust.

Temperatures were generally mild, except for a brief warm period during the second week of the month. Light precipitation occurred in the Sierra Nevada near Yosemite on the 27th. Otherwise, no precipitation was reported anywhere in our forecast area. Periods of gusty winds happened several times during the month. Winds were generally from the east and southeast, generated by surface high pressure coupled with upper-level low pressure systems over the Great Basin (or the weather pattern that typically produces Santa Ana winds in Southern California). Thus, the strongest winds impacted areas in the Tehachapi Mountains, as well as below the passes and canyons in Kern County towards the Grapevine and the south end of the San Joaquin Valley on the 30th. The strongest gusts that day reached around 60 to 70 miles per hour and reduced visibilities due to blowing dust.

November

Warmer than average with variable precipitation. No precipitation was reported anywhere in our forecast area until the 20th, and on this particular day, precipitation occurred mainly over Kern County. However, additional storms brought precipitation to much of the region on the 27th through the 30th. Dense fog was generally non-existent in the San Joaquin Valley due to the lack of rainfall for much of the month.

Warmer than average temperatures prevailed for much of the month. Dry weather with high pressure systems continued along with periods of gusty east/southeast winds similar to those during the previous month. Precipitation occurred mainly after the 26th of the month in areas north of Kern County. However, areas in Kern County received precipitation as early as the 20th. Above average precipitation accumulated in portions of the Sierra Nevada and much of Kern County as a result of the active weather during the latter part of the month. Quite a few thunderstorms with small hail, isolated funnel clouds, and an EF-0 tornado was reported near Woodlake on the 27th. In the San Joaquin Valley, rainfall reached around 0.5 to 2 inches for these last several days of the month. Snowpack finally began to accumulate in the Sierra Nevada starting on the 26th. Strong winds developed near the Grapevine (gusts to 80 miles per hour) at the end of the month. The mountain passes along Highway 58 and Interstate 5 were closed due to snow on the 27th and 28th, and snow levels dropped as low as 2,000 feet. Quite a few Kern County desert locations received several inches of snow on the 28th. Otherwise, locations in the Sierra Nevada above 7,000 feet received up to 2 feet of snow during this period and around a foot at elevation from around 4,000 to 7,000 feet.

December

Warmer than average with near to above average precipitation. Dense fog and persistent low clouds developed in the San Joaquin Valley between storm systems during mainly the second

week. Otherwise, a consistent storm pattern with at least one to two storms per week occurred throughout much of the month.

Above average precipitation prevailed for the first week of the month, with the highest amounts in Merced and Mariposa Counties on the 1st and 2nd. An active weather period continued at times until the 8th, and a funnel cloud was reported near Lemoore during the afternoon. Dense fog during the nights and mornings impacted the San Joaquin Valley during periods between precipitation events. Periods of southeast winds occurred in the middle part of the month in Kern County in the south end of the San Joaquin Valley, the Grapevine, and Tehachapi Mountains, mainly due to winds ahead of low pressure systems. Additional storm systems brought precipitation on the 14th and 15th and on the evening of Christmas Day through the evening of the following day. The system on the evening of the 25th until the 26th lasted about 24 hours and was a rather cold storm system that brought snow to elevations around 2,000 feet in quite a few mountain and desert locations throughout Kern County. Many road closures resulted from snow cover in the Kern County mountain areas and nuisance flooding in the south end of the San Joaquin Valley, including in Bakersfield. A record high daily precipitation amount of 0.62 inch was set for the 26th, which broke the old record of 0.18 inch for the date in 1968. Snow amounts were around a foot in Frazier Park and Tehachapi with even higher amounts, or to around two feet, in the mountain communities west of Frazier Park (such as Pine Mountain Club and Cuddy Valley). Liquid precipitation amounts exceeded an inch in the aforementioned areas in Kern County, even into the Kern County desert. Despite the active precipitation periods, temperatures were very mild with few areas of freezing temperatures in the San Joaquin Valley. In fact, Fresno had its 4th warmest December on record, and Bakersfield tied for its 8th (with 1955 and 2010).

Overall, the year was much warmer than average in terms of annual average temperature, with the exception of the Sierra Nevada, adjacent foothills, and the Kern County desert region where temperatures were near to below average (Fig 1). In terms of how warm it was this year, Bakersfield reached 14th warmest year on record, and six of the warmer years have occurred in recent years, or since 2012. Fresno had its 8th warmest year on record, and the other five warmer years recorded in Fresno also occurred since 2012. During 2019, near average to above average precipitation fell in locations throughout the region (Fig 2).

Significant Weather Events

January 17th – A tornado (EF-1 on the Enhanced Fujita Scale, with estimated winds of 86 to 111 miles per hour) was reported a few miles northeast of Clovis that caused damage to a barn and extensive roof damage to nearby buildings.

February 2nd – A tornado (EF-0 with estimated winds around 60-85 miles per hour) that caused no damage occurred several miles to the southeast of Mariposa.

February 10th-11th – Interstate 5 was shut down during the evening and overnight hours through the Grapevine due to snow and icy roadways.

February 21st – A very cold storm brought snow to elevations to around 500 feet in the east side of Porterville and the east side of the San Joaquin Valley along the Sierra Nevada foothills and

much of the Kern County mountain areas. This also prompted a shutdown of Interstate 5 through the Grapevine for much of that day; there was even snow below the CHP Weigh Station in Grapevine.

March 6th – A neighborhood near Weldon in eastern Kern County was evacuated due to high flows along Kelso Creek. This was because of recent heavy rain and rapid snow melt that brought runoff from the nearby Kern River.

April 22nd-25th – Significantly warm temperatures occurred in the San Joaquin Valley and the Kern County desert, as highs reached near 100 degrees.

May 15th -16th – A cold late season storm brought several inches to around a foot of snow fell above 5,000 feet in the Sierra Nevada, and around 0.50 to 1.00 inch of rain fell in the San Joaquin Valley.

May 19th - An EF-0 tornado touched down between Lemoore and Huron; a large pistachio tree was uprooted and moved about 100 feet. Otherwise, scattered showers and thunderstorms brought brief heavy rain and small hail.

May 25th -26th – Another cold late season storm brought widespread rain and mountain snow, and several inches of snow fell above 4,000 feet in the Sierra Nevada. Temperatures only reached into the 50s on the 26th in the San Joaquin Valley due to persistent cloud cover and rainfall.

May 31st – June 2nd – A very active pattern down to persistent low pressure along the West Coast brought showers and thunderstorms to the Kern County mountains, Sierra Nevada, and the hills along the west side of the San Joaquin Valley.

Oct 30th – A strong easterly wind event brought gusty winds and blowing dust to Bakersfield, the Grapevine, and the Tehachapi Mountains. Gusts reached near 60 miles per hour in the south end of the San Joaquin Valley and about 65 miles per hour at the Grapevine CHP Weigh Station. Stronger gusts, or above 70 miles per hour, were observed in the Tehachapi Mountains to the east of Bakersfield.

November 20th – The first storm of the cool, wet season arrived in Kern County. Most locations in this area observed around 0.10 to 0.75 inch.

November 26th – 30th – An active period of relatively cold storms brought rain and mountain snow. This was significant, as many locations (outside of Kern County) reported rain for the first time of the cool, wet season (generally from October until April). The mountain passes along Highway 58 and Interstate 5 were closed due to snow on the 27th and 28th. Quite a few Kern County desert locations received several inches of snow on the 28th. In addition, a tornado (EF-0) was reported near Woodlake (northeast of Visalia) on the afternoon of the 27th.

December 1st-2nd – An atmospheric river brought around two to three inches of rainfall at elevations below 8,000 feet to the Sierra Nevada and adjacent foothills in Mariposa County and

much of Merced County. Nonetheless, no widespread flooding was reported as a result of this rainfall.

December 26th–27th – Moderate to heavy rain, followed by heavy snow and icy roadways prevented travel through much of the mountain passes in Kern County, as well as in much of the Kern County desert. Icy roads developed as freezing rain fell in Tehachapi during the late evening hours of the 26th. Interstate 5 through the Grapevine was shut down for about 36 hours during these days.

Annual Temperature and Precipitation Rankings for 2019 at Bakersfield and Fresno:

Bakersfield – Tied for 14th warmest on record (with 1976); reached 11th highest annual precipitation on record.

Fresno – 8th warmest year on record; tied for 34th highest annual precipitation (with 1916) on record.

Table 1: Annual Average Temperature and Total Precipitation vs. Departure from Average for NWS-owned ASOS sites in the NWS Hanford, CA Forecast Area

City	Monthly Average Temperature (nearest 0.1 deg)	Departure from Average (nearest 0.1 deg)	Total Precipitation (nearest 0.01 inch; T = trace amount)	Departure from Average (nearest 0.01 inch)	Percent of Average
Bakersfield	67.0	+1.3	9.11	+2.64	140.8
Fresno	66.3	+1.9	12.40	+0.90	107.7
Hanford	64.4	+1.4	9.94	-0.16	98.4
Madera	64.3	+2.0	10.69	-1.33	88.9
Merced	62.6	+0.8	14.36	+1.86	114.9

Figure 1: Departure from Average Temperature for 2019

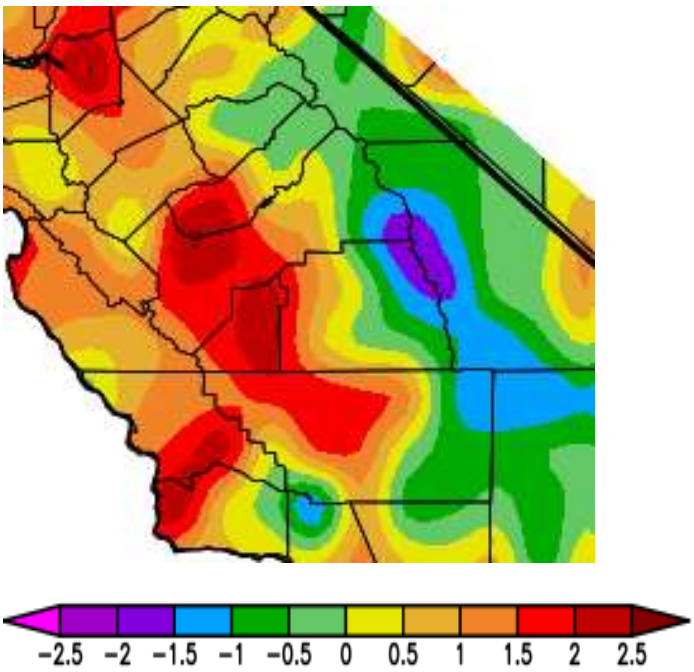
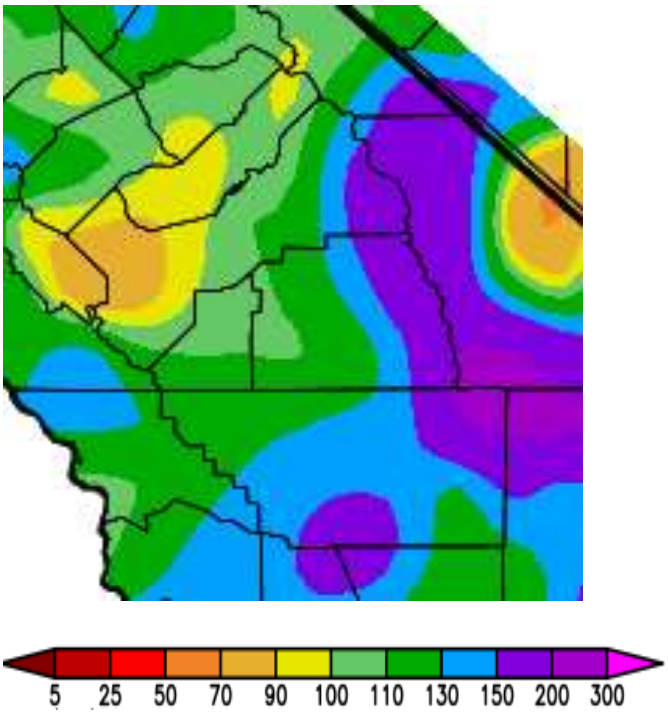


Figure 2: Percent of Average Precipitation for 2019



*Images above (i.e., Figures 1-2) courtesy of Western Region Climate Center.